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Dear Josh:

I am sorry for the slow response to your note of November 26, but it only arrived here in Sarasota yesterday after being forwarded by my secretary at Cornell. I am doing some extensive writing, and Sarasota is a much more hospitable place than upstate New York in the winter.

Many thanks for forwarding a copy of the paper by Schneour. I am familiar with some of the work on graphite biodegradation, but I do not recollect this specific paper.

However, I believe that what he studied and the focus of our current research are somewhat different. Our data show that organic compounds become progressively less available for microbial metabolism, uptake by animals and toxicity to a variety of species, probably including man. In some soils, ca. 90% of what we measure chemically is not available biologically. In other soils, the values are substantially less. The practical implications: current analytical methods for organic pollutants overestimate, sometimes appreciably, the severity of pollution at some and possibly many sites—and that decisions should be made on the basis of availability to organisms and not to some arbitrary extractant.

The likely mechanism of this sequestration: penetration of the organic molecules into minute pores in the soil (we have made measurements showing that some soils have an abundance of pores even as small as 8 nm [others have measured even smaller pores]) and their sorption on the pore surfaces and/or the very slow diffusion of the molecules into the solid phase of the soil. We have data with models to support both postulated mechanisms. Pores of diameters 8 nm or less are obviously too small for any bacterium or even for extracellular enzymes. If diffusion out of the nanopores or solids is very slow, bioavailability would be drastically affected.

Regards,


Martin

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